

09/659, 241

Provisional application

PS 9/11/01

HIGH DENSITY CAST-IN-PLACE SAMPLE PREPARATION CARD

This appn claims benefit to 760/153,606 9/13/94 and 601/195,780 4/10/00.

BACKGROUND OF THE INVENTION

Test plates for chemical or biochemical analysis which contain a plurality of individual wells or reaction chambers are well known laboratory tools. Such devices have been employed for a broad variety of purposes and assays, and are exemplified in U.S. Patent No. 4,734,192 and 5,009,780, for example. Microporous membrane filters and filtration devices containing the same have become especially useful with many of the recently developed cell culture techniques, assays, and sample preparation methods, especially in the fields of virology, immunology, genetics, drug discovery, etc. Typically, a 96-well filtration plate is used to conduct multiple sample preparations or assays simultaneously. One such filtration device commercially available from Millipore Corporation under the name "Multiscreen" is a 96-well filter plate that can be loaded with adsorptive filter materials or particles. However, with the thousands of samples that can be analyzed in a single day for genotyping, for example, even a 96-well plate, which allows the simultaneous treatment of 96 samples, can be inadequate.

In addition, flexibility in the dimensions of multi-well plates is desirable in view of the wide variety of applications that can be performed. Membrane type, well geometry and layout are important criteria in choosing the appropriate sample preparation device for a particular operation. Furthermore, many modern analytical techniques such as matrix assisted laser

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operations, on sample mass loads less than 1 microgram in volumes of a few microliters or less, as well as larger mass loads and volumes. These structures preferably are self-retaining and/or self-supporting.

In addition, the present invention provides for direct analysis, such as by MALDI time-of-flight (TOF) mass spectrometry, of samples without elution. This is accomplished by configuring the insert such that it is compatible with conventional mass spectrometers and can be appropriately positioned in the spectrometer for direct analysis.

In another embodiment, unfilled structures which are preferably self-retaining and/or self-supporting are cast in situ into one or more wells in a suitable insert and can be used for either size-based or adsorptive separations wherein the cast structure acts as a semi-permeable barrier, or for adsorption. The adsorptive properties of a non-particle filled structure can be imparted either through the native properties of the polymer(s) used or by subsequent derivatization.

In another embodiment, either the filled or unfilled structures which may be self-retaining and/or self-supporting are derived from inorganic materials such as metals or ceramics.

BRIEF DESCRIPTION OF THE DRAWINGS

Figures 1A and 1B are top views of multi-well filtration cards in accordance with the present invention;

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9/1/04 This appln has at least one drawing executed in color. Copies of this patent or patent application with color drawing(s) will be provided by the office upon request and payment of the necessary fee.

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